

## INSTITUTE FOR GRAPHIC COMMUNICATION, INC.

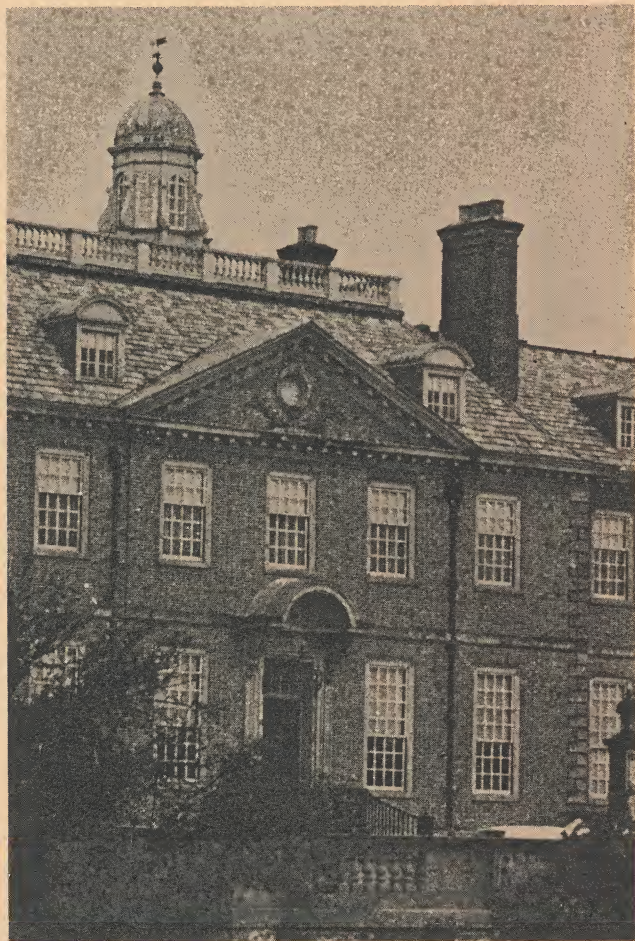
Is a group of scientists, inventors, legal, financial, and marketing specialists internationally recognized for their accomplishments in fields relating to visual communications. Additional IGC services include consultation, research and development, and the publication of IGC Monthly.

President Leonard E. Ravich Vice-President Dr. Walter Clark



AUG 1971

THE INSTITUTE FOR  
GRAPHIC COMMUNICATION



*A famous and beautiful oceanside estate on Massachusetts' North Shore, Castle Hill offers living accommodations and conference facilities blissfully free from all distractions. Participants will find their creature comforts completely and unobtrusively cared for, permitting them total involvement in a stimulating sequence of lectures, formal and informal discussions and, when needed, leisure time activities. The opportunity for a total learning experience is unique.*

announces:

## HARD COPY GENERATION FROM COMPUTER-LINKED DISPLAY TERMINALS

an intensive conference  
to be presented at the  
**IGC Conference Center**  
Castle Hill  
Ipswich, Massachusetts

SEPTEMBER 12, 13, 14, 1971

IGC

## REGISTRATION

### HARD COPY GENERATION FROM COMPUTER-LINKED DISPLAY TERMINALS CASTLE HILL, IPSWICH, MASS.

SEPT. 12, 13, 14, 1971

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

ORGANIZATION \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE — OFFICE \_\_\_\_\_

HOME \_\_\_\_\_

ARRIVING BY: ☐ PLANE ☐ CAR

### ADDITIONAL REGISTRANTS

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

Mail registration application with fee to:

RICHARD D. MURRAY, Registrar

INSTITUTE FOR GRAPHIC COMMUNICATION

520 Commonwealth Ave.

Boston, Mass. 02215

Tel. (617) 267-4278

Make check payable to:

Institute for Graphic Communication, Inc.

### SOME OF THE ORGANIZATIONS THAT HAVE BEEN REPRESENTED AT IGC CONFERENCES

Addison-Wesley  
Addressograph-Multigraph Corporation  
Agfa-Gevaert, Inc.  
Alphanumeric Textran, Ltd.  
American Can Company  
Azoplate Corporation  
Bell Telephone Laboratories  
Boston Museum of Fine Arts  
Canadian Government Printing Bureau  
CBS Laboratories  
Central Intelligence Agency  
Chase Manhattan Bank  
Comfax Communications  
Computer Sciences Corporation  
Consolidated Papers, Inc.  
Copley Newspapers  
DATAMAX Corporation  
Defense Communications Agency  
A.B. Dick Company  
Digital Equipment Corporation  
Dow Chemical Company  
E. I. duPont de Nemours and Company  
Eastern Color Printing Company  
Eastman Kodak Company  
F. Eberstadt and Company  
Fitchburg Coated Products  
GAF Corporation  
General Electric Company  
General Services Administration  
Goddard Space Flight Center  
W. R. Grace and Company  
Graphic Sciences, Inc.  
Great Northern Paper Company  
Harris-Intertype Corporation  
IBM  
International Communications Corporation  
International Paper Company  
Itek Corporation  
Jet Propulsion Laboratory  
Library of Congress  
Litton Industries  
LogEtronics, Inc.  
3M Company  
Magnavox  
Mallinckrodt Chemical Works  
McGraw-Hill Information Systems  
Matsushita Electric Company of America  
MGD Graphic Systems  
Mobil Oil Corporation  
Monroe Electronics  
Monsanto Company  
Moore Business Forms, Inc.  
Motorola, Inc.  
National Archives and Records Service  
Naval Electronics Systems Command  
New York Times  
Olivetti-Underwood  
Owens-Illinois, Inc.  
Pako Corporation  
Perkin-Elmer Corporation  
Philco-Ford Corporation  
Pitney Bowes, Inc.  
Plastic Coating Corporation  
Polaroid Corporation  
Potter Instrument Company  
Printing Developments, Inc.  
Raytheon Company  
Republic Publishing Company  
Riegel Paper Company  
Riverside Press  
St. Joseph Lead Company  
St. Regis Paper Company  
Sandia Laboratories  
Scott Printing Corporation  
Scientific American  
Simon and Schuster, Inc.  
Stromberg Datagraphix, Inc.  
Sylvania  
Time, Inc.  
Trans-Canada Newspapers, Ltd.  
UNIVAC  
U. S. Army Night Vision Laboratory  
U. S. Army Topographic Laboratories  
S. D. Warren Company  
Western Electric Company  
Western Litho Plate Company  
Weyerhaeuser Company  
Xerox Corporation



## HARD COPY GENERATION FROM COMPUTER-LINKED DISPLAY TERMINALS

**Purpose:** The computer-linked display terminal is here. One of its original selling points was the reduction of the "paper blizzard" which did occur as typewriter/paper terminals were replaced by soft copy screens. It has since been determined, however, that the user of the display has a need, both practical and psychological, for information in hard copy form. More and more manufacturers and designers of display terminals are looking into the appropriate means for adding a hard copy capability to their products. It is intended that this conference review the requirements for hard copy, present the state of the art in the field, and discuss in detail the future of the display terminal and its coupling to hard copy systems. This conference should be of value to all those interested in new hard copy systems, including manufacturers of reproduction media and devices, manufacturers of display terminals, market researchers, product planners, senior R&D personnel, engineering managers, and investment analysts.

### Sessions will be held on the following topics:

- Introduction to the Computer-Linked Display
- The Need for Hard Copy
- The CRT Display As a Light Source
- The Matrix Display As a Light Source
- System Requirements for the Imaging System
- Photographic Requirements for the Imaging System
- Imaging Systems — Fit To Requirements
- Matching the Imaging System to the Display
- The Future of Hard Copy

### Conference Leaders:

Felix H. Brown, Chairman — Owens-Illinois  
Frederick E. Carroll — Sanders Associates  
Thomas B. Cheek — Adage, Inc.  
Dave R. Kazen — Venture Associates  
Richard D. Murray — Institute for Graphic Communication  
Leonard E. Ravich — Institute for Graphic Communication

**Attendance:** Restricted to 30 participants with registrations accepted on a first-come, first-served basis. This will allow an active dialogue to be established as an integral part of each session and ensure maximum information transfer between conference leaders and attendees.

**Fee:** \$365.00 per registrant (\$325.00 without room). In addition to conference participation this fee includes accommodations, meals, beverages, conference materials and all necessary extras. Reduced rates are available for companies sending two or more representatives.

**Location/Arrival:** The Castle Hill Conference Center is located in Ipswich, Massachusetts, some thirty miles north of Boston. Participants arriving by air, between the hours of 2 and 5 P.M., will have the use of the Passenger Service Lounge in the American Airlines terminal as a meeting place, and transportation to and from Castle Hill will be provided.

For those coming by automobile, the Center is easily reached by taking Route 128 North to Route 1A (Exit 20N), following the signs toward Ipswich, and turning right at a large Castle Hill sign just before Ipswich Center. Participants will of course be briefed in detail on all such matters upon receipt of their applications.

*Professional Certificates will be awarded  
to all participants.*

## PROGRAM

Sunday, September 12, 1971

**4:00-5:00 P.M.** — Arrival and registration at Castle Hill (See Arrival Information), time to unpack and familiarize yourself with the Center and its surroundings.

**5:45 P.M.** — Cocktails

**6:30 P.M.** — Dinner — to be followed by an informal opening session in the conference room, including a brief orientation on IGC; background on the Castle Hill estate; general introduction of conference participants and subject matter; outline of conference objectives; introduction of speakers.

Monday, September 13, 1971

**8:00-8:45 A.M.** — Breakfast served.

**9:00 A.M.** — SESSION I

(Coffee breaks midway through each session)

### Introduction to the Computer-Linked Display

- General Description
- Human Factors
- Parameters and measurements
- Cathode ray devices
- Comparison of direct view CRT techniques
- Data conversion systems and techniques
- Matrix display techniques and systems
- Applications

### The Need for Hard Copy

- Display terminals and their uses
- Operator characteristics
- Why hard copy?
- Markets for hard copy units
- Interactive versus passive displays
- Imaging systems versus electromechanical systems
- Does hard copy equal facsimile?
- Hard copy units vs "print-all" and "print-only" units
- Time shared hard copy units

**12:30 P.M.** Luncheon

**2:00 P.M.** — SESSION II

### The CRT Display as a Light Source

- Brightness and spectral distribution
- Resolution versus intensity
- Contrast
- Imaging characteristics for fiber optic and thin window CRTs
- Getting the light to the image plane:
  - optics
  - slave CRT
  - deflection
  - projection
- Distortion problems
- Special problems associated with low light levels

### The Matrix Display as a Light Source

- Electroluminescent displays
- AC and DC plasma displays
- LED displays
- Liquid crystal displays
- Brightness and spectral distribution
- Geometrical and structural differences among matrix displays and their effect on imaging

**5:00 P.M.** — Adjournment and free time for further discussion, relaxation, etc.

**5:45 P.M.** — Cocktails

**6:30 P.M.** — New England Clam bake on front lawn (weather permitting) including native lobster, clams and corn on the cob.

**Tuesday, September 14, 1971**

Wake-up and breakfast

**9:00 A.M. — SESSION III**

#### **System Requirements For The Imaging System**

- Differences between hard copy and office copy requirements
- Available space
- Ease of operation
- Reliability for passive and interactive displays
- Capture versus access time
- Size of copies
- Paper standards
- Frequency of service

#### **Photographic Requirements For The Imaging System**

- Speed, resolution, contrast
- Gray scale pro and con
- Security — should all colors be captured?
- Capture of fixed format projection or overlay
- Permanence
- Storage and processing requirements
- Cost of consummables

#### **Imaging Systems — Fit To Requirements**

- Electrophotographic processes and materials, including electrostatic, PIP, organic photoconductors, photoconductive toners, free radical systems, VHS, color in color and electropaint
- Unconventional silver halide processing, including stabilization, DTR, dye transfer web
- Unconventional silver systems, including dry silver materials and RS
- Free Radical processes, including Dylux, 1264 and Horizons
- Organic systems, including diazo, photochromics and photopolymers

**12:30 P.M.** — Luncheon

**1:30 P.M. — SESSION IV**

#### **Matching the Imaging System to the Display**

- Cost or quality
- Copy volume
- Sophistication of terminal
- Properties of display

#### **The Future of Hard Copy**

- Existing hard copy units — advantages and limitations
- Future developments in terminals and displays, including home facsimile, picturephone reproduction, etc.
- Future requirements for imaging systems
- Future developments in imaging systems

**4:15 P.M.** — Transportation departs for Logan Airport; estimated arrival time 5:30 P.M.

## **CONFERENCE LEADERS**

**Felix H. Brown**, Chief Graphic Scientist, Owens-Illinois, Okemos, Michigan

Mr. Brown currently directs activities at Owens-Illinois concerned with hard copy generation from matrix displays and with adding color capability to matrix displays. Previously he was with Rahn Corporation where he developed imaging techniques for novel electrophotographic processes. He was also a member of the Radiation and Solid State Laboratory at N.Y.U. where he investigated the interaction of radiation with organic materials. He has authored more than a dozen papers in the fields of reprography and display, including papers on PIP and on the properties of phosphor materials. He holds many patents in both fields. Mr. Brown is a member of SPSE, SID and ACS.

**Frederick E. Carroll**, Manager of the Peripherals Department, Sanders Associates, South Nashua, New Hampshire

In his current position, Mr. Carroll has engineering design responsibility of all peripherals for Sanders' display equipment line, including printers, punch card equipment, mag tape cassettes and drives, and magnetic disc file systems. Previously he was Director of Engineering for Mohawk Data Sciences' Research and Development Center.

Earlier at MDS, Mr. Carroll was Manager of Development Engineering and was responsible for the equipment developed for Automatic Digital Information Network (AUTODIN) Program and the Teleprinter System for Ft. Monmouth, New Jersey.

Mr. Carroll was previously employed by the Raytheon Company where he was a Project Manager in the Prototype Development of the MAR II Radar for the NIKE X System, and in Marketing of FAA and military displays and command-control systems.

Mr. Carroll received his BSME from the University of Maine and had done graduate study in Mechanical Engineering at Northeastern University. He has also completed special courses at MIT and Columbia University.

He is a member of the Institute of Electrical and Electronic Engineers (IEEE), the Society of Photographic Engineers and Scientists, the Society for Information Display and is a Massachusetts Registered Professional Engineer.

**Thomas B. Cheek**, Engineering Manager, Small Terminal Devices, Adage, Inc., Boston, Mass.

Mr. Cheek's current work includes system designs with low cost graphic CRT terminals, graphic input devices, hard copy units, and communications systems.

From 1968 to 1970, Mr. Cheek was Engineering Vice President of Computer Displays, Inc., and was responsible for the design and technical integrity of all the company's products. In December 1970, Computer Displays merged with Adage and Mr. Cheek assumed his present position.

Previous to his association with Computer Displays, Mr. Cheek was a member of the Display Group of the Electronic System Laboratory at MIT. There he designed the prototype of the ARDS display for operation of Project MAC's computer time sharing system.

Previously he served as an officer and principal engineer for Beaver Research Corporation.

Mr. Cheek received his Bachelor's and Master's degrees in Electrical Engineering from MIT. He was awarded the National Alumni's scholarship. He is a member of Tau Beta Pi, Eta Kappa Nu, Sigma Xi, IEEE and SID. He has participated in various symposiums, and has written numerous articles in the field of Information Display.

**Dave R. Kazen**, Partner, Venture Associates, Kenilworth, Illinois

Mr. Kazen is a partner in Venture Associates, a consulting firm serving the reprographic, micrographic, graphic arts and data communications fields. Prior to this he was Vice President and Director of Research for the Kenilworth Corporation, Manager of Photographic Research for A. B. Dick Company and Manager of Photo-Optical Studies for Chicago Aerial Industries, Inc. He has published and presented numerous papers and has been an active seminar participant, having lectured for, among others, the American Management Association. He has ten patents issued and several pending. He has been awarded the SPSE Service Award, and was the Chicago Chapter President, a national Director, Lectureship and Service Award Chairman, and 1967 Conference Chairman, all for SPSE. Current activities center on dry imaging, CRT printout and photocomposition.

**Richard D. Murray**, Director of Conferences, Institute for Graphic Communication, Boston, Massachusetts

Mr. Murray has twelve years of broad reprographic technical and market research experience. Until recently he functioned as a Reprographic Specialist for EG&G's Graphic Systems Division. He has developed several novel imaging processes, including thermographic, heat developable diazonium, Itek RS, chargeless, electrophotographic, and dielectric recording at Itek, Cue and EG&G. He is responsible for the evaluation and process design of a dielectric recording process which is being used in a facsimile recorder under development for the Air Force. He is a member of SPSE (1968 Service Award winner), ACS, TAPPI, NMA and SID. He has organized and chaired seminars for SPSE on "Applications of Lasers to Photography and Information Handling", "Novel Imaging Systems" and "Computer Handling of Graphical Images", and edited Proceedings for each. Two U.S. patents have been granted and two more are pending. Mr. Murray currently is Director of Conferences for the Institute of Graphic Communication. Representative conferences organized by him include "Electrophotography", "Facsimile", "New Directions in Printing Technology", Reprographic Markets for Imaging Systems" and "Micrographics — Critique and Search for New Directions."